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TRUSTEC® energy products

# MOBILE ENERGY -AUTARKY-

## What do humans need?

- Self-sufficient energy supply
- Energy storage from sun and wind
- Accu-technology without any risk

**TRUSTEC E-HYB® mobil**

*The energy certainty!*

TRUSTEC® energy products

# Trustec Energy Products

**A Company participating in the renewable segment**

## OUR COMPANY

**Our Scope of Activities:**

**Manufacturing and delivery of top-quality high-tech solar products through our regional TRUSTEC partners as well as local traders in the individual countries. Our goal is to boost the share of electrically transformed solar and wind energy**

For the implementation of renewable power generation, TRUSTEC provides certain innovative state-of-the-art technologies that can be specially customized under consideration of any geological conditions prevailing in the different countries. Our TRUSTEC technology combines top-level quality with safe and sturdy construction, high efficiency and cost-effectiveness, all of which being enabled by our comprehensive network of partners and sales agents. Our technology has been designed to be sustainable and environmentally friendly, aiming at self-sustaining power generation and gradually replacing fossil fuels even today.

**Our Portfolio:**

- **Energy Storage** provided through the TRUSTEC-E-HYB range of products
- **Solar technology** that serves for grid as well as for insular systems
- **Premium-quality** grid and insular inverters
- **TRUSTEC wind power** technology Wind / sun tracker for solar charging spots in self-sustained power supply stations.

**Business Perspectives:**

**Development of specific solar power generation and storage systems** based on 25 years of experience in the field of both solar power and energy storage.

Selection of qualified manufacturers (mainly from Europe), e.g. for TRUSTEC grid inverters using the PLATINUM-DIEHL/AKO Technology (10 years of warrantee / optionally up to 20 years resp.) for the required technical components such as solar modules, assembly systems, monitoring technologies, batteries, cables, plugs as well as windmills to supplement solar power generation.

Establishment of a TRUSTEC partner sales and long-term service in many different countries

Further development within the field of future technologies, likewise covering future methods of energy storage such as hydrogen / carbon dioxide (= synthetic natural gas) and similar systems.

**Business Perspectives:**

In order to secure investors' interests, TRUSTEC may publish the addresses of renowned manufacturers and forward original guarantees of aforementioned manufacturers to their customers.
In case of any warrantee or liability claims occurring, only the manufacturer or the product may be held liable, which is to the benefit of all parties involved, i.e. investors, sales partners and TRUSTEC as your supplier and power generation partner.

**Our company philosophy:**

trustworthy technology for power generation,
Known from our slogan **"TRUST creates Energy"**

# Delivery Scope
## mobile/ solar/ inverter


| | | page |
|---|---|---|
| **E-HYB „mobil“ - the smallest solar plant**<br>230V AC + 12V DC directly from the sun<br>mobil - with lithium-store cell up to 2,5 kWh | | 4 |
| **TRUSTEC Solar Moduls**<br>12/ 27/ 55/ 60<br>Solar modules from Germany<br>+ far east production | | 6 |
| **TRUSTEC Power Accu**<br>Starter/ Energy<br>Iron Lithium Phosphate Technology | | 8 |
| **TRUSTEC pure sine wave inverter**<br>SK-series<br>Our trusty classic<br>in the inverter marketplace | | 10 |
| **TRUSTEC pure sine wave inverter**<br>ST-series<br>Inverter with grid interconnection | | 12 |
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| **TRUSTEC battery charger**<br>CX-series<br>Lead/ gel/ lithium with interface | | 16 |
| **TRUSTEC battery charger**<br>BP & CK-series<br>Proven technology | | 18 |

TRUSTEC energy products

# TRUSTEC E-HYB mobil
## A complete solar/ wind plant

Made in Germany

## *E-HYB mobil -Energy from sun/ wind -found everywhere-*

**This compact, complete TRUSTEC E-HYB solar power generation system increases the lifestyle quality for those who need 230 V AC or 12 V DC from 720 Wh up to 2400 Wh.**

### E-HYB-mobil is made up of premium components such as:

- pure sine inverter
- lithium-iron-yttrium-battery
- charge control device
- cell monitoring/ voltage & temperat.
- deep discharge protection
- display of battery capacity
- charging current, current consumption, inverter function
- robust and sturdy ABS/PC-housing (refer to page 14)

### It provides the optimum solution for:

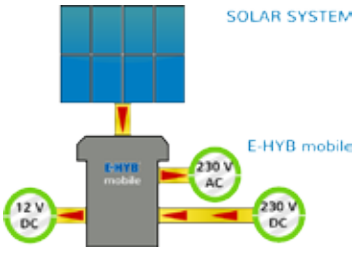
- small residental units all over the world
- also to be used for gardens, cars and boats, for sales vehicles and technical vehicles, too.

### Sturdy construction:

- heat-resistant up to XX °C
- splash-water resistant in the plastic case
- expected operating time up to 15 years (according to use)

### The portable E-HYB-mobile units are up to now unparalleled on the world market.

They comprise the technology of a complete solar plant with wind power, charge controller, rechargeable battery, inverter as well as control techniques. Solar modules – or a small wind turbine - just need to be connected producing 230 V AC and 12 V DC everywhere in the world.




***EASY AND SIMPLE ASSEMBLY INSTALLATION:***

*1. Arrange the solar panels to their requested positions.*
*2. Connect the cables of the modules to the "E-HYB".*
*3. The yttrium-lithium-iron-battery will be charged now.*
*4. Switch on the TRUSTEC-E-HYB -> Sinus inverter is working -> 230 V can be picked off.*

*This way the generated solar current will be free of charge for many years (230 V + 12V).*

# TRUSTEC E-HYB mobil
## Technical details

Made in Germany

| technical details: | | | |
|---|---|---|---|
| Typ | TEM 720/ 230 | TEM 1200/ 230 | TEM 2400/ 230 |
| **Solar Technology** | | | |
| Moduls 80 W mono (2-4 panels) | 1 | 2 | 4 |
| Maximum solar system Wp | 170 | 170 | 340 |
| Average daily output in Watt for system installed in DK / DE / GR / ZY / EGY | 240/ 254/ 315/ 363/ 415 | 481/ 508/ 630/ 363/ 415 | 961/ 1017/ 1260/ 363/ 415 |
| daily output/ max. energy | 601/ 508/ 630/ 726/ 830 | 1202/ 1017/ 1260/ 1451/ 1660 | 2404/ 2033/ 2519/ 2902/3320 |
| Elevated modules | yes | | |
| Rubber-protection for modules (round) | yes | | |
| Charge Controller | yes | | |
| M solar cable with connector | 5 | 5 | 10 |
| MC 4 + photovoltaic connector | yes | | |
| **Lithium battery:** | | | |
| Voltage V | 12 | 12 | 12 |
| Storage capacity (compared to lead gel batteries) | $60_{120}$ | $100_{200}$ | $200_{400}$ |
| Charge-Cape-state-monitoring | yes | | |
| Display A / V / cap / | yes | | |
| Direct current - 12 V terminals | yes | | |
| Photovoltaic charging terminals, max. V | 18 | 18 | 18 |
| Output protection | yes | | |
| Grid charger - through supply unit A | 10 | 10 | 15 |
| Overload protection | yes | | |
| **Pure sine wave inverter output:** | | | |
| AC voltage | 230 | 230 | 230 |
| Rated/ Peak capacity | 700/ 1400 | 1000/ 2000 | 1500/ 3000 |
| Wave type | Sinus (THD < 3%) | | |
| Frequency | 50 / 60 Hz switchable by DIP switch | | |
| AC regulation | +/- 3% | | |
| LED display | Input voltage level<br>Output load level and error status | | |
| **Input:** | | | |
| No-load current | 1.2 | | 1.40 on 12V/ 0.70 on 24V |
| Stand-By current A | 0,25 | | 0.28 on 12V/ 0.15 on 24V |
| Efficiency in & | 91% | | 90% bei 12V/ 93% on 24V |
| **Protection:** | | | |
| Low battery level - alarm: | 11 | | 11/ 22 |
| Low battery level - shut down | 10.5 | | 10.5/ 21 |
| Overvoltage | 15.3 | | 15.3/ 30.6 |
| Overheating | Switch-off output voltage - automatically switched on when temperature decreases | | |
| Short circuit | Switch-off output voltage, energy is switched on automatically | | |
| Cooling | Load-controlled ventilator | | |
| **Ambience:** | | | |
| Working temperature °C | 0 -+ 40 | | |
| Operating humidity | 20 - ca. 90% RH non condensing | | |
| **Safety & EMC** | | | |
| Compliance with: | ENS55022 class A<br>EN61000 3-2.3<br>EN60950 - 1 | | |
| Meassurements (width x height x depth) | 450 x 400 x 250 mm | 450 x 450 x 250 mm | 450 x 650 x 250 mm |
| Weight | 18 kg | 25 kg | 30 kg |

## TRUSTEC flexible solar modules - 30/ 60/ 100/ 135W

**TRUSTEC high-efficient, top-quality, flexible solar modules (max. 30°) for professional application in every vehicle-, boat- and roof types. For the reliable mobile energy supply.**

Through the back-contact technique the cells can be coated with a flexible material thus producing high-efficient flexible PV-Modules.

**These modules are suitable for:**

- slightly inclined surfaces (max. 30°)
- every vehicle-type (from Golf cars to camping vehicles)
- every boat-type (from sailing boats to Yacht)

**Characteristics:**

- PV-module with max. 30° bending
- High-efficient cells with up to 21,5 % efficiency
- up to 25 % higher yields than conventional PV-module
- extremely lightweight PV-modules

**max. recommended bending degree: 30°**

| | HMB-30W | HMB-60W | HMB 100W | HMB 135W |
|---|---|---|---|---|
| Pm(W): | 30W | 60W | 100W | 135W |
| Voc(V): | 21.2 | 21.0 | 21.6 | 29.5 |
| Isc (A): | 1.83 | 3.84 | 5.97 | 5.82 |
| Vmp(V): | 17.6 | 17.5 | 17.8 | 24.9 |
| Imp(A): | 1.70 | 3.43 | 5.62 | 5.45 |
| Efficiency: | 19.6% | 19.6% | 19.9% | 20.00% |
| Module size (mm): | 535 x 378 x 3 | 725 x 535 x 3 | 1050 x 540 x 3/ 1175 x 540 x 3 | 1435x540x3 |
| Cell-size (mm): | 1/3 125 x 125 | 1/3 125 x 125 | 4 x 8/ 4 x 9 | 125x125 |
| Junction box: | QC0911-1 with wire | QC0911-2 with wire | QC0911-2 with wire | QC0911-2 with wire |
| Cell-connections type: | series connections, 32=4 x 8 | series connections 64=4x16 | series connection 36=4x9 | series connection 44=4x11 |
| Weight (kg): | 0.49 | 0.93 | 1.35 | 2.00 |

## *TRUSTEC Mini-PV-Module - 30/ 60/ 100/ 135 W*

**These small PV-modules achieve the highest efficiency through the back-contact technique and reach a higher solar yield up to 25 %.**

The plus- and minus-pole of the single cells is located on the back side, in this way the complete cell surface is available and can produce energy from the solar radiation.

**Areas of application:**

general solar roof system
off-grid system
street lighting system.

**Characteristics:**

- high-efficient cells with up to 20 % efficiency
- up to 25 % higher yield than conventional PV-module
- extremely lightweight PV-module

| | HMG-30W | HMG-60W | HMG 100W | HMG 135W |
|---|---|---|---|---|
| Pm(W): | 30W | 60W | 100W | 135W |
| Voc(V): | 21.2 | 21.0 | 21.6 | 29.5 |
| Isc (A): | 1.83 | 3.84 | 5.97 | 5.82 |
| Vmp(V): | 17.6 | 17.5 | 17.8 | 24.9 |
| Imp(A): | 1.70 | 3.43 | 5.62 | 5.45 |
| Efficiency: | 22.0% | 19.6% | 19.9% | 20.00% |
| Module size (mm): | 535 x 378 x 30 | 725 x 535 x 35 | 1050 x 540 x 35/ 1175 x 540 x 35 | 1435x540x35 |
| Cell-size (mm): | 1/3 125 x 125 | 4x16 | 4 x 8/ 4 x 9 | 125x125 |
| Junction box: | JB007 without wire | JB016 with wire | JB016 with wire | JB016 with wire |
| Cell-connections type: | | series connections 64=4x16 | series connection 36=4x9 | series connection 44=4x11 |
| Weight (kg): | 2.2 | 5.7 | 7.6 | 10.2 |

TRUSTEC® energy products

**TRUSTEC SOLAR MODULS**
**Centrosolar**

Made in Germany

## *TRUSTEC SOLAR-MODULE - S-Serie 12/ 27/ 55/ 60*

**TRUSTEC Solar Modul of the Small Series of top quality for professional usage by German Manufacturer "Centro-solar". A reliable mobile power supply.**

- Solar modules with 36 high-performance solar cells
- High performance also during low irradiation and months with diminished light
- Salt spray corrosion tested accord. to DIN EN ISO 9227-NSS
- Ammonia resistant
- Sturdy, seawater-resistant aluminium frame
- Frost resistant frame construction
- Large, waterproof junction box equipped with spring-type terminals
- Weather and water proof foil provides highest life expectancy even under extreme climatic conditions
- Made in Germany
- certified according to DIN EN ISO 9001:2008 and ISO 14001:2009
- up to 26 years performance guarantee according to the specific warranty terms of the manufacturer

| Technical details (STC) | S240M36 Ultra | S325P36 Ultra | S405M36 Ultra | S560P36 Ultra |
|---|---|---|---|---|
| Module-Typ | mono | poly | mono | poly |
| Performance class Wp | 60 | 80 | 100 | 140 |
| Voltage (Umpp) in V | 17,4 | 18 | 17,2 | 17,9 |
| Current (impp) in A | 3,7 | 5 | 5,9 | 7,82 |
| Open circuit voltage (Voc) in V | 21,9 | 21,68 | 21,5 | 21,8 |
| Short-circuit current (Isc) in A | 4 | 5,45 | 6,2 | 8,42 |
| Module efficiency in % | 11,4 | 13,1 | 14,5 | 13,7 |
| system voltage in V | 12 | | | |
| TK (Pmpp) in %/K | -0,45 | | | |
| TK (Uoc) in %/K | -0,36 | | | |
| TK (Isc) in %/K | 0,03 | | | |
| NOCT in °C | 46 +/- 2 | | | |
| Dimensions (WxDxH) in mm | 775x680x40 | 1070x680x40 | 1237x557x40 | 1500x680x40 |
| Weight in kg | 6,6 | 8,6 | 7,9 | 12,1 |

# SOLAR MPP-TRACKER
## fast tracking for a maximum performance

Made in Germany

TRUSTEC® energy products

### Solar MPP-TRACKER

The maximum power point tracking technology will boost the efficiency of your system. Inexpensive solar modules that were actually designed for power feed-in, may be used in these 12V/24V systems. Electronic protection (polarization, over currents, short circuits, over temperature )High degree of efficiency – suitable for mounting on top-hat rails - negative earthing. With innovative maximum-power-tracking technology, Phocos' MPP-Tracker ensures maximum performance from your solar array at all times and in all weather conditions. The MPPT can yield an energy gain of up to 30% from your PV array (with the average gain being 10%-25%).

When a Central Unit is used, up to 16 MPPTs can be used together in one system. The charge regulation is then done via data bus by the Central Unit. This will enable you to increase your system capacity substantially. The temperature-compensated three-stage I-U curve charge regulation alogarithm significantly extends the lifespan of your battery. The possibility to use less expensive grid-feed-in solar-panels with up to 95V open circuit voltage

| Typ | MPPT 100/30 | MPPT 100/20 |
|---|---|---|
| nominal voltage | 12V/24V autom. Cognition | |
| nominal battery charge current | 30 A | 20 A |
| max.Modulinput voltage | 95 V | |
| max. PV-power | 450W 12V; 900 W 24V | 300W 12V; 600W 24V |
| max.Battery load current | 33A | 20A |
| max. eficiency | 98,00% | 97,00% |
| consumption of auxiliaries noload „ | <30mW bei 12VSystemvoltage (>2mA)<br>>80mW bei 24V Systemvoltage (>3mA)“ | |
| temperaturcompensation | minus 4mV/cell *K | |
| cross section cable | 32 qmm | |
| dimension | 185 x 150 x 115 mm | |
| weight | 1,6 kg | |
| operating temperature | - 40°C up to +50°C | |
| protection class | IP 22 | |

### Solar Charge Controller

| | | TT-CM | TT-CA | TT-CML | TT-CX | TT-PL | TT-CJS |
|---|---|---|---|---|---|---|---|
| key features | system voltage | 12 V | 12 V | 12/24 V | 12/24 V | 12/24/32/36/48 V | |
| | solar nominal load | 4,0 A | 5,8A | 5,8/10/15/20 A | 10/20/40 A | 20/40/60 A | |
| | load current | None | 6,8 A | 5,8/10/15/20 A | 10/20/40 A | 20,7/30 A | |
| | charge controlling | Shunt | Serie | Serie | Serie | Serie o. Serie&Shunt | |
| overload protection | PWM battery load | x | x | x | x | PWM or on/off | technical Details |
| | temperature compensation | x | x | x | x | PreSet or user spez. | on request |
| | balance charging | | | x | x | PreSet or user spez. | |
| | charge increase | | | | | PreSet or user spez. | |
| | ventilated or sealed battery | x | x | by jumper | by menue | PreSet or user spez. | |
| discharge contactor | controlling operations | voltage | voltage or SOC | voltage or SOC | voltage | PreSet or user spez. | |
| | Battery deep discharge protection | | | | x | | |
| informations-options | display battery and charger | 1 LED | 3 LED | 5 LED | Grafik LCD | Digital LCD | |
| | audible alarm | | | x | x | | |
| | manuel safety circuit breaker | | | | x | | |
| | Data control m.opt.PC connector | | | | USB | RS232C | |
| Safety | reserve palaity protection | x no load | x | x | x | x | |
| | short circuit protection | electr. Fuse | | | | | |
| | overheat control | | | | x | x | |
| | overvoltage protection | x without load | x | x | x | x | |
| | overload protection | | only load | | PV and load | | |
| | current reserve | x | x | x | x | x | |
| other features | night light function | | | | x | x | |
| | external temper. Sensor | | | | x | x | |
| | PCB coating | x | x | x | x | x | |
| | system temperature | -40 °C bis +50°C | | | | | |
| | max. cable | 16 qmm | | | | 32 qmm | |
| | IP protection class | IP 22 | | | | | |
| | certificate | CE | CE WeltBank | CE WeltBank | CE | CE | |

**POWER ACCU**
**The stable Traction Battery**

# NEW
## LITHIUM STORAGE BATTERIES
**light - compact - safe - high performance**

## *Power Accu - The stable traction battery*

**TRUSTEC-Power-Accu "Traction"- Lithium-power supply as never before. Light, compact and reliable Lithium-Accu construction = up to 4 times more energy - "A very profitable long-term investment"**

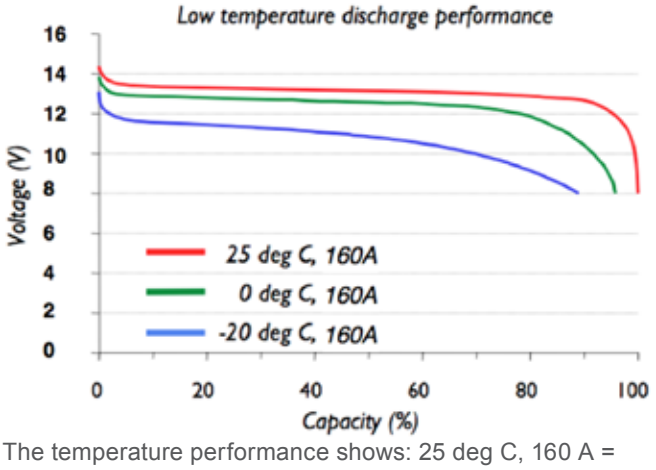
**Iron Lithium Phosphate Technology**
**Very high operating and function safety**

The advantages during engine-starting:

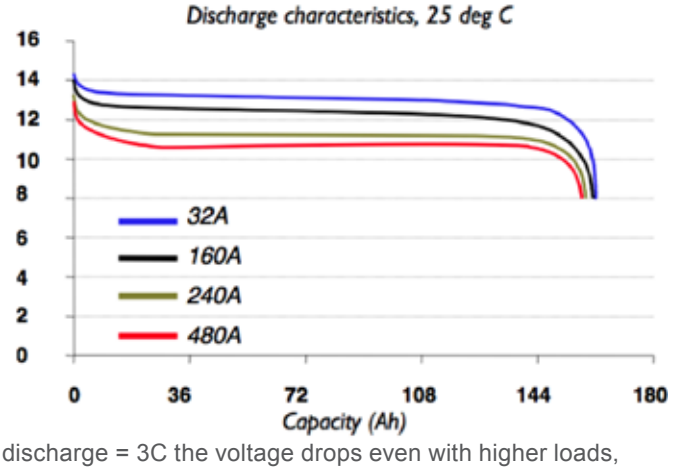
- Small weight : ca 80% saving
- Very compact: just 1/3 of the usual size
- Rapid charging capability: ca. 1h/1C
- Charging by means of normal charging devices e.g. Trustec-TCX-series,also with dynamo
- Ventilation not required
- Higher discharge current up to 3C continuously
- Steady voltage curve
- Lowest self-discharge: 10% per year
- Integrated battery manage system
- Integrated melt fuse and cell balancing
- Data interface CANopen
- Full Ah supply, even though with higher power
- Serial connection up to 1100V permitted
- Triggering for external protection relay
- Aluminium-plastic case
- Contact connections: 2 x plus, 2 x minus
- Long lifecycle

| Traction Batteries / Designation | System | max. continuous discharge at 13,2 V (A/W) | discharge puls current/ performance (A/W) | Nominal capacity/ power 13,2 V (Ah/Wh) | Charge method CC CV to 14,4V (A) | high/low storage operating temperature (charge) (°C) | high/low operating temperature (discharge) (°C) | High rate discharge performance at 20°C (Ah/Wh) | weight (Kg) | small volume W x H x D mm |
|---|---|---|---|---|---|---|---|---|---|---|
| TP-TR 12V3200E-AC | Balancing | 12/158 | 28/370 | 3,2 /42 | 3,2 | +60/-20 | +60/-20 | 2,88/38 | 0,45 | 114x82x35 |
| TP-TR 12V6400E-BC | Balancing | 24/317 | 56/739 | 6,4 /84 | 6,4 | +60/-20 | +60/-20 | 5,76/76 | 0,85 | 114x82x62 |
| TP-TR 12V10E-CC | Balancing | 36/475 | 84/1100 | 9,6 /127 | 10 | +60/-20 | +60/-20 | 8,64/114 | 1,3 | 120x95x82 |
| TP-TR 12V19E-EC-SC | Balancing | 72/950 | 168/2200 | 19,2/253 | 19 | +60/-20 | +60/-20 | 15,36/203 | 2,5 | 120x180x82/ 200x141x96 |
| TP-TR 12V26E-FC-SC | Balancing | 96/1300 | 224/3000 | 25,6/338 | 26 | +60/-20 | +60/-20 | 20,48/270 | 3,2 | 120x238x82/ 249x141x96 |
| TP-TR 12V32E-SC | Balancing | 120/1600 | 280/3700 | 32/422 | 32 | +60/-20 | +60/-20 | 25,6/337 | 4,2 | 248x140x95 |
| TPC-TR 12V50E-MC | BMS | 150/2000 | 250/3300 | 50/660 | 50 | +45/0 | +60/-20 | 45/594 | 11 | 270x245x175 |
| TPC-TR 12V100E-NC | BMS | 300/4000 | 500/6600 | 100/1300 | 100 | +45/0 | +60/-20 | 90/1188 | 20 | 365x265x190 |
| TPC-TR 12V160E-OC | BMS | 480/6300 | 800/10500 | 160/2100 | 160 | +45/0 | +60/-20 | 144/1841 | 28 | 415x290x190 |

# Power Accu Traction - performance

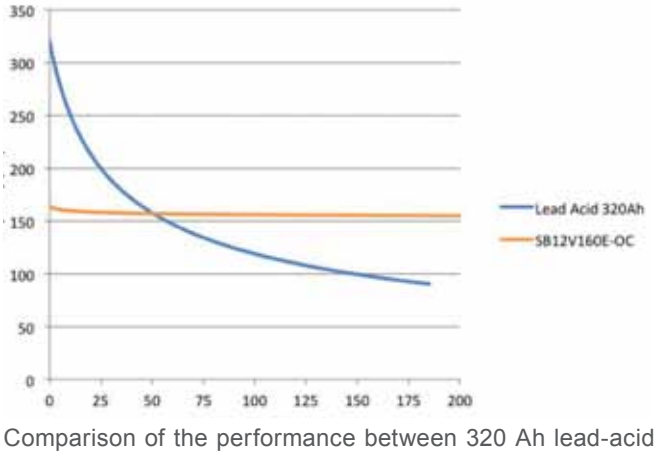



The temperature performance shows: 25 deg C, 160 A = 100%
0 deg C, 160 A = 88%
-20 deg C, 160A = ca.60%

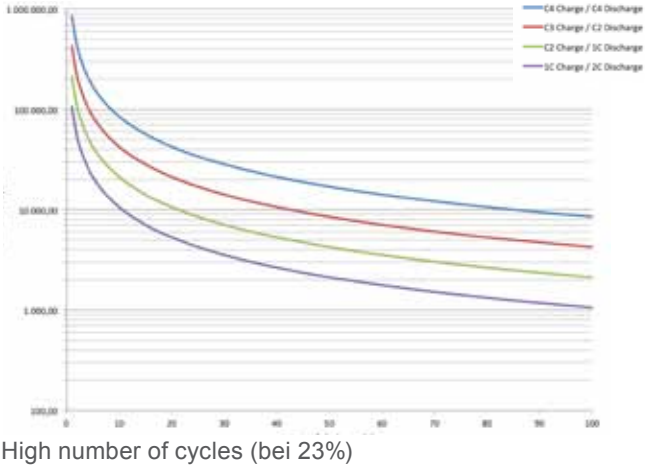



discharge = 3C the voltage drops even with higher loads, but the capacity remains about the same. The voltage drops down in relation to the load and remains stable till the end at the same time.

Peukert Graphics




Comparison of the performance between 320 Ah lead-acid battery and 160 Ah lithium-battery. during discharge with 600 Watt the lead- acid battery has a capacity of just ca. 160Ah = 1/2 of the nominal caopacity. As the lead-acid battery can be discharged just for the 50% the lithium- battery 160Ah Batterie can offer 4 times more the total capacity.



High number of cycles (bei 23%)
4 different charge-/ discharge curve at 80% discharge

**Power Accu**
**The ultra light Starter Battery**

# Power Accu - The ultra light Starter Battery

**TRUSTEC-Power-Accu "Start"- Lithium - great, unexpected, reliable power is contained in this new, light, durable, reliable and very compact battery. Incredibly high starting power!**

**Iron Lithium Phosphate Technology**
**Very high operating and function safety**

**Smaller, lighter, more powerful and durable**
**The best starter battery**

The advantages during engine-starting:

- Sensational starting-power performance Kg/A
- Small weight : ca 80% saving
- Very compact: just 1/3 of the usual size
- Rapid charging capability: ca. 1h/1C
- Recharging after starting within ca. 5 minutes
- Charging by means of dynamo
- Steady voltage curve
- Lowest self-discharge: 10% per year
- Full Ah supply, even though with higher power
- Vehicles 12V –external protection relay-
- Plastic case
- Contact connections: 1 x plus, 1 x minus
- Long lifecycle: more than 5 years
- Extreme performance even with extreme temperature

Ideal by engine starting for motorcycles, cars, jet-skis, snowmobiles, ATVs, quads, micro-ultralight fliegers, sport airplanes (not certified)

| Starter Batteries<br>Designation | motorcycles - engines (ccm) | car/racing engines | Aviation | discharge puls current (1 sec./)perf. (A/W) | max. continuous discharge at 13,2 V (A/W) | Nominal capacity/ power 13,2 V (Ah/Wh) | charge current (4C)/ charge current for endurance (1C) | high/low operating temperature (°C) | high/low storage temperature (°C) | High rate discharge Performance at 20°C (Ah/Wh) | weight (Kg) | small volume W x H x D mm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TP-ST 12V2600P-AC** | 450 | | | **150/1980** | 50/660 | 2,6/34 | 10/3 | -30/+60 | -50/+60 | 2,185/29 | **0,45** | 114x82x35 |
| **TP-ST 12V5200P-BC** | 1000 | | | **300/3960** | 100/1320 | 5,2/68 | 20/6 | -30/+60 | -50/+60 | 4,37/57 | **0,85** | 114x82x62 |
| **TP-ST 12V7800P-CC** | 1500 | | x | **450/5940** | 150/1980 | 7,8/103 | 30/9 | -30/+60 | -50/+60 | 6,555/86 | **1,3** | 120x93x82 |
| **TP-ST 12V10P-DC** | Harley | 2 L | x | **600/7920** | 200/2640 | 10/130 | 40/12 | -30/+60 | -50/+60 | 8,74/115 | **1,7** | 120x127x82 |
| **TP-ST 12V15P-EC** | | 3 L | | **900/11880** | 300/3960 | 15/198 | 60/18 | -30/+60 | -50/+60 | 13,11/173 | **2,5** | 120x180x82 |
| **TP-ST 12V15P-SC** | | 3 L | | **900/11880** | 300/3960 | 15/198 | 60/18 | -30/+60 | -50/+60 | 13,11/173 | **2,9** | 200x132x77 |
| **TP-ST 12V20P-FC** | | 4 L | | **1200/15840** | 400/5280 | 20/264 | 80/24 | -30/+60 | -50/+60 | 17,48/231 | **3,2** | 120x236x82 |
| **TP-ST 12V20P-SC** | | 4L | | **1200/15840** | 400/5280 | 20/264 | 80/24 | -30/+60 | -50/+60 | 17,48/231 | **3,6** | 248x140x95 |
| **TP-ST 12V25P-SC** | | 6 L | | **1500/19800** | 500/6600 | 25/330 | 100/30 | -30/+60 | -50/+60 | 21,85/288 | **4,2** | 248x140x95 |

## Optimate Lithium Charger

**OptiMateTM lithium, the first OptiMate to protect your LiFePO4 battery in a way no other charger did before! The new OptiMate lithium will protect your investment and guarantee your Lithium Iron Phosphate (LiFePO4 / LFP) battery will perform as advertised for a very long time. With 5 Amps of charge current available OptiMate lithium unique multi step ampmaticTM program recharges and balances cells within the battery quickly and efficiently. OptiMate lithium's maintenance program delivers current to the vehicle circuitry, protecting and keeping the battery at 100% charge. OptiMate lithium – Battery Performance Guaranteed!**

| | |
|---|---|
| Recommended for | All TRUSTEC TR/ TS batteries |
| Programme control | ampmaticTM microprocessor |
| Input current max. | 0,55A @ 230V |
| Typical annual energy cost | < €1 (continuous maintenance) |
| Reverse drain current | less than 0,001A |
| Output current (bulk charge) | 0,4A – 5,0A |
| Automatic desulphation | multistage (high voltage, turbo and pulsed mode) |
| Charge time limit | 24 hours (maintenance time: unlimited) |
| Maintain / test cycles | 30 min/30 min (alternating hourly) |
| Charge retention test | Range: 10,1 - 13,3V. GOOD (green) = battery voltage > 13,3V |
| Size | 199 x 71 x 61mm |
| Weight | 740g |
| Enclosure classification | IP54 |
| Mounting | easy direct wall mounting |
| Input cable length | 2m |
| Output cable length | 2m |
| Included Accessories | SAE-71 fused eyelet set, weather protected |
| Included Accessories | SAE-74 clamps set for bench charging |
| Operation temperature range | -40°C / +40°C |

**How it works**

1. Pre-qualification test: OptiMate Lithium displays the condition of the battery before charging and measures environment temperature. The ampmaticTMcharge program is selected according to temperature and battery condition.

2. Low Volts recovery: The safeTo protection mode controls charging during this sensitive battery SAVE stage, to ensure that an over discharged battery will be correctly and safely recovered. Tests are conducted through-out the SAVE program to determine if the battery has successfully recovered and can advance to BULK CHARGE.

3. Bulk charge: the ampmaticTM processor actively adjusts charge current to match battery capacity and condition, achieving a complete charge in the shortest time. Progress is tracked against the ideal charge curve for LiFePO4 batteries.

4. Short-circuited / dead cell check: Charge progress is tracked against the ideal LiFePO4 charge curve, internal damage will be detected and unnecessary charging is prevented of a battery that cannot be recovered.

5. Absorption and equalisation: for 10 minutes the current is delivered in pulses with voltage controlled between 14,0 and 14,3V, aiding cell voltage equalisation and improving the battery's overall power delivery.

6. Charge verification: the voltage is limited at 13,6V while the ampmaticTM processor monitors the current absorbed by the battery. If this reveals a less than optimal charge, the program reverts to absorption for a further 10 minutes.

7. Voltage retention test: is conducted for 30 minutes during which no charge current is delivered, with 5 possible test results indicating the battery's general state of health. A green (voltage > 12,7V) result extends the test up to 12 hours, to check for excessive self discharge or higher than expected power loss through the vehicle's electrical system.

8. Charge maintenance: The 12 hour MAINTENANCE CHARGE CYCLE consists of 30 minute float charge periods at a voltage of 13,6V followed by and alternating with a 30 minute 'rest' (no charge current) periods. During the float charge period current is delivered only if the battery has lost charge due to connected vehicle circuitry. A refresh cycle may be performed if the charge level has dropped significantly.

## TRUSTEC SB-DBD-250

**TRUSTEC´s external under and overvoltage protector, to secure Power Accu tractions batteries against under- and overvoltage with the lowest possible stand-by current.**

**Boot**
Before the BDB-250 becomes operational, it has to determine if a 12V or a 24V system is connected. This means that after connecting the BDB-250, the first thing it does is wait a second before doing anything else. After this, if the input voltage is above 10.0V below and 15.4V, the relay will close. If these conditions are not met, the relay will open.

**High voltage**
If the input voltage rises above 15.0V, the LED will start blinking to indicate a detected overvoltage. This will continue for 90 seconds after which the relay will be opened and the LED will turn off. When the voltage rises above 15.4V, the entire "warning" process will be skipped and the relay will switch off immediately. Low voltage If the input voltage drops below 10.0V, the LED will blink to indicate an under-voltage situation. This will continue for 90 seconds after which the relay will be opened and the LED will turn off.

**RESET**
When the BDB-250 is switched off and the voltage returns between 11.0V and 14.0V, there are two ways to re-activated it. If the user has chosen the automatic reset function, the relay of the BDB-250 will be activated directly after a "correct" voltage has been measured. However, when the manual reset function has been programmed, the user has to reset the BDB-250 by hand. This is done by pressing the build-in switch. If an external switch is connected to the remote input, this can also be used to reset it manually. The manner in which the BDB-250 will be reset is programmable by the user. The manner in which this is done can be found under "Programming"

**Programming**
The user can choose if the BDB-250 is reset manually of automatically. This is done by pressing the programming button and holding it down until the LED flashes. This indicates that the BDB-250 is in programming mode. At this point the button must be released. When the button is pressed once now, the automatic reset function is selected. If the user presses the button twice, the manual reset is selected. Approximately 4 seconds after the last time the button is pressed, the LED will blink to show the programmed reset function. (e.g.: If position 2 – manual reset – is selected, the LED will blink twice.)

| | |
|---|---|
| SKU | |
| Autodetect 12V | 8V to 20V |
| Autodetect 24V | 20V to 35V |
| Current consumption | 2mA |
| Input surge current (100ms) 12V mode | 2,6A |

| | |
|---|---|
| Input surge current (100ms) 24V mode | 5,0A |
| Switch current Continues | 250A |
| Switch current Peak | 1,500A |
| Dimensions WxHxD | 82x57x120 mm |
| Weight | 370 g |

# TRUSTEC PURE SINE WAVE INVERTER
## 200 ~ 3000W

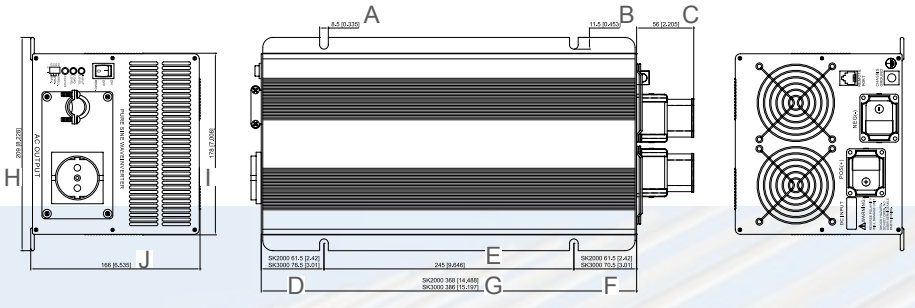
SK series

## *200 ~ 3000W Pure Sine Wave Inverter*

**TRUSTEC-Pure-Wave Inverter "the trusty classic inverter in the vehicles"**
**proven technology from 350 to 3000 W - millions in use worlwide** produced for TRUSTEC by Cotek

### Features :

- True sine wave output (THD < 3%)
- Power ON-OFF remote control
- Input and output fully isolation
- Load control cooling fan
- Advanced microprocessor
- Output frequency 50/60 Hz switch selectable
- e13 / CE / FCC approved
- Output short circuit / overload / over temperature protections
- Tri-color indicators display input, output level and failure status
- Input polarity reverse / under voltage / over voltage protections




Unit : mm [inch]

| | 200/350W | 700W | 1000/1500W | 2500/3000W |
|---|---|---|---|---|
| A | 6.5mm | - | 7mm | 8.5mm |
| B | 7.75mm | - | 11.5mm | 11.5mm |
| C | - | - | 43.49mm | 56mm |
| D | 22.75mm | 38.5mm | 72/87mm | 61.5/76.5mm |
| E | 132mm | 196mm | 196mm | 245mm |
| F | 22.75mm | 38.5mm | 72/87mm | 61.5/70.5mm |
| G | 177.5mm | 273mm | 340/370mm | 368/386mm |
| H | 147mm | 179mm | 182/191mm | 209mm |
| I | 126.44mm | 152mm | 155/164mm | 178mm |
| J | 61.3mm | 72mm | 88.5mm | 166mm |

# TRUSTEC PURE SINE WAVE INVERTER
## 200 ~ 3000W

TRUSTEC® energy products

## SK series

| Model | | SK200 | SK350 | SK700 | SK1000 | Sk1500 | SK2000 | SK3000 |
|---|---|---|---|---|---|---|---|---|
| Rated Output Power | | 200W | 350W | 700W | 1000W | 1500W | 2000W | 3000W |
| Surge Power | | 400W | 700W | 1400W | 2000W | 3000W | 4000W | 6000W |
| AC Voltage | | 100/ 110/ 120 VAC or 220/ 230/ 240 VAC | | | | | | |
| AC Waveform | | True sine wave (THD < 3%) | | | | | | |
| AC Regulation | | ,-3% ~ +5% | | | | | | |
| DC Input Voltage | | 12 VDC, 24VDC or 48 VDC | | | | | | |
| Working Temp. | | 0 ~ + 40° C | | | | | | |
| EMC & Safety Standards | 100/ 110/ 120 VAC | UL458 (For SK 350, SK700, SK1000, and SK1500 in „GFCI“ Receptacles), Compliance to FCC Class A | | | | | | |
| | 220/ 230/ 240 VAC | Compliance to EN55022 Class A, Compliance to EN61000 – 3 – 2, 3, Compliance to EN60950-1<br>Compliance to e-13*72/ 245/ EEC, 95/ 94/ EC, CISPR 25 (2nd edition 2002), ISO 7637-2 : 2004 | | | | | | |
| Packing | | 185x147x60 mm | | 296x180x72 mm | 338x182x88 mm | 415x191x88 mm | 422x208x166 mm | 452x208x166 mm |
| | | 1.5kg; 6sets<br>11.5kg; Carton | | 3kg; 6 sets<br>22kg; Carton | 4kg; 4sets<br>20kg/ Carton | 4.8 kg; 4sets<br>22.5kg/ Carton | 8.85kg; 2sets<br>20.5kg/ Carton | 10.2 kg; 2sets<br>23.2kg/ Carton |
| Warranty | | 2 years | | | | | | |

| Model | | SK200/350-212 | SK200/ 350-224 | SK200/350-248 | SK700/1000-212 | SK700/1000-224 | SK700/1000-248 |
|---|---|---|---|---|---|---|---|
| Output | LED-Indictor | Fault status (Red) | | | Input voltage level, output load level and fault status | | |
| Input | DC Voltage | 12VDC | 24VDC | 48VDC | 12VDC | 24VDC | 48VDC |
| | Voltage Range | 10.5 ~ 15.0VDC | 21.0 ~ 30.0VDC | 42.0 ~ 60.0VDC | 10.5 ~ 15.0VDC | 21.0 ~ 30.0VDC | 42.0 ~ 60.0VDC |
| | Efficiency (Typ.) | 91% | 93% | 94% | 91% | 93% | 94% |

| Model | | SK1500/2000-212 | SK1500/2000-224 | SK1500/2000-248 | SK3000-212 | SK3000-224 | SK3000-248 |
|---|---|---|---|---|---|---|---|
| Output | LED-Indictor | Input voltage level, output load level and fault status | | | Input voltage level, output load level and fault status | | |
| Input | DC Voltage | 12VDC | 24VDC | 48VDC | 12VDC | 24VDC | 48VDC |
| | Voltage Range | 10.5 ~ 15.0VDC | 21.0 ~ 30.0VDC | 42.0 ~ 60.0VDC | 10.5 ~ 15.0VDC | 21.0 ~ 30.0VDC | 42.0 ~ 60.0VDC |
| | Efficiency (Typ.) | 90% | 93% | 94% | 90% | 93% | 94% |

## *Power inverter Remote Control*

**This user friendly remote control is easy to understand and set - up**

CR series

| Model No. | Length | Dimensions (WxL) mm | Application |
|---|---|---|---|
| CR-5 | 10'/ 25'/ 50' | 53.5 x 70.0 | S1500 Series |
| CR-6 | 10'/ 25'/ 50' | 130.0 x 120.0 | SK Series, ST Series (except ST600), SD Series |
| CR-8 | 10'/ 25'/ 50' | 53.5 . 70.0 | SK Series, ST Series, SD Series, SE350 |

TRUSTEC energy products

# TRUSTEC PURE SINE WAVE INVERTER
## 200 ~ 3000W

ST series

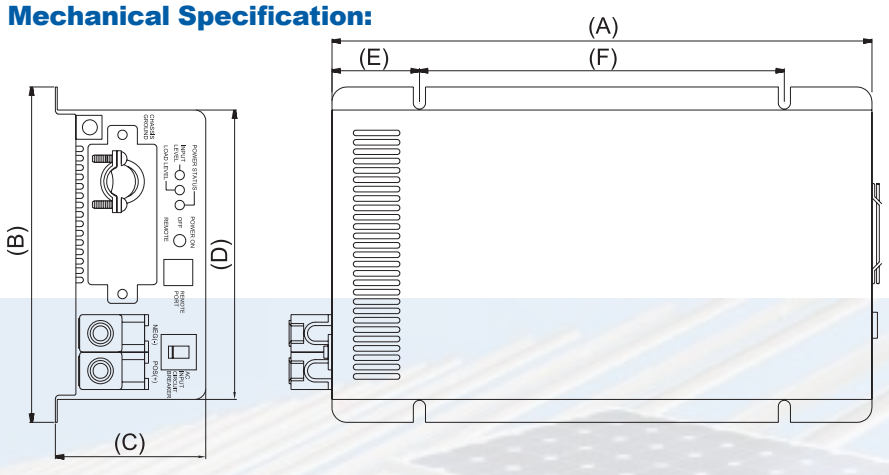
## 200 ~ 3000W Pure Sine Wave Inverter

**TRUSTEC-Pure-Wave Inverter "with reliable transfer switch"**
**reliable technology from 600 to 2500 W** produced for TRUSTEC by Cotek

### Features :

- True sine wave output (THD < 3%)
- Power ON-OFF remote control
- Input and output fully isolation
- Load control cooling fan
- Advanced microprocessor
- Built-in transfer switch and AC circuit breaker
- ROF(remote override function) or ignition lockout function option
- e13 / CE / FCC approved
- Speed up transfer time and syn chronized operation with utility AC source
- Output short circuit / overload / over temperature protections
- Tri-color indicators display input, output level and failure status Input polarity reverse / under voltage / over voltage protec-tions

### Mechanical Specification:




| | 600W | 1000W | 1500W | 2000W | 2500W |
|---|---|---|---|---|---|
| A | 290mm | 373mm | 403mm | 433mm | 463mm |
| B | 179mm | 236mm | 332mm | 332mm | 332mm |
| C | 80.9mm | 115.8mm | 115.8mm | 118.65mm | 118.65mm |

| | 600W | 1000W | 1500W | 2000W | 2500W |
|---|---|---|---|---|---|
| D | 154.5mm | 206mm | 206mm | 302mm | 302mm |
| E | 47mm | 88.5mm | 103.5mm | 118.5mm | 133.5mm |
| F | 196mm | 196mm | 196mm | 196mm | 196mm |

# TRUSTEC PURE SINE WAVE INVERTER
## 200 ~ 3000W

TRUSTEC® energy products

ST series

| Model | ST600 | ST1000 | ST1500 | ST2000 | ST2500 |
|---|---|---|---|---|---|
| Rated Output Power | 600W | 1000W | 1500W | 2000W | 2500W |
| Surge Power | 2050W | 2000W | 3000W | 4000W | 5000W |
| AC Voltage | 100/ 110/ 120 VAC or 220/ 230/ 240 VAC | | | | |
| AC Waveform | Pure sine wave (THD < 3%) | | | | |
| DC Input Voltage | 12 VDC, 24VDC or 48 VDC | | | | |
| Power Saving Setting | No | 20 ~ 110W | | 40 ~ 220W | |
| LCDE Indicator | Input voltage level, output load level and fault status | | | | |
| Working Temp. | 0 ~ + 40° C | | | | |
| EMC & Safety Standards | Meet UL458, Compliance to FCC Class A | | | | |
| | Compliance to EN6100-3-2, 3/ Compliance to EN60950-1, Compliance to EN55022 Class A<br>Compliance to e-13*72/ 245/ EEC, 95/ 54/ EC, CISPR 25 (2nd edition 2002), ISO 7637-2 : 2004 | | | | |
| Packing | 290x179x80 mm | | 373x236x115 mm | 403x236x115 mm | 433x332x115 mm |
| | 3.3kg; 4sets<br>15kg/ Carton | 6.2kg; 2sets<br>14kg/ Carton | 7.0kg; 2sets<br>15kg/ Carton | 11.2kg; 1set<br>13kg/ Carton | 12kg; 1 set<br>14kg/ Carton |
| Warranty | 2 years | | | | |

| Model | | ST600-212 | ST600-224 | ST600-248 | ST1000-212 | ST1000-224 | ST1000-248 |
|---|---|---|---|---|---|---|---|
| Output | Voltage | 220/ 230/ 240V +/- 3% | | | 220/ 230/ 240V +/- 3% | | |
| | Transfer switch | 12 Amp | | | 25 Amp | | |
| Input | No Load Current Draw | 0.83 A | 0.43 A | 0.22 A | 1.25 A | 0.65 A | 0.35 A |
| | DC Voltage | 12VDC | 24VDC | 48VDC | 12VDC | 24VDC | 48VDC |
| | Voltage Range | 10.5 ~ 15.0VDC | 21.0 ~ 30.0VDC | 42.0 ~ 60.0VDC | 10.5 ~ 15.0VDC | 21.0 ~ 30.0VDC | 42.0 ~ 60.0VDC |
| | Efficiency (Typ.) | 91% | 93% | 94% | 90% | 93% | 94% |

| Model | | ST1500-212 | ST1500-224 | ST1500-248 | ST2000-212 | ST2000-224 | ST2000-248 |
|---|---|---|---|---|---|---|---|
| Output | Voltage | 220/ 230/ 240V +/- 3% | | | 220/ 230/ 240V +/- 3% | | |
| | Transfer switch | 16 Amp | | | 15 Amp | | |
| Input | No Load Current Draw | 1.40 A | 0.70 A | 0.40 A | 2.30 A | 1.10 A | 0.65 A |
| | DC Voltage | 12VDC | 24VDC | 48VDC | 12VDC | 24VDC | 48VDC |
| | Voltage Range | 10.5 ~ 15.0VDC | 21.0 ~ 30.0VDC | 42.0 ~ 60.0VDC | 10.5 ~ 15.0VDC | 21.0 ~ 30.0VDC | 42.0 ~ 60.0VDC |
| | Efficiency (Typ.) | 92% | 93% | 94% | 90% | 93% | 94% |

| Model | | ST3000-212 | ST3000-224 | ST3000-248 |
|---|---|---|---|---|
| Output | Voltage | 220/ 230/ 240V +/- 3% | | |
| | Transfer switch | 15 Amp | | |
| Input | No Load Current Draw | 2.32 A | 1.15 A | 0.68 A |
| | DC Voltage | 12VDC | 24VDC | 48VDC |
| | Voltage Range | 10.5 ~ 15.0VDC | 21.0 ~ 30.0VDC | 42.0 ~ 60.0VDC |
| | Efficiency (Typ.) | 90% | 93% | 94% |

TRUSTEC®
energy products

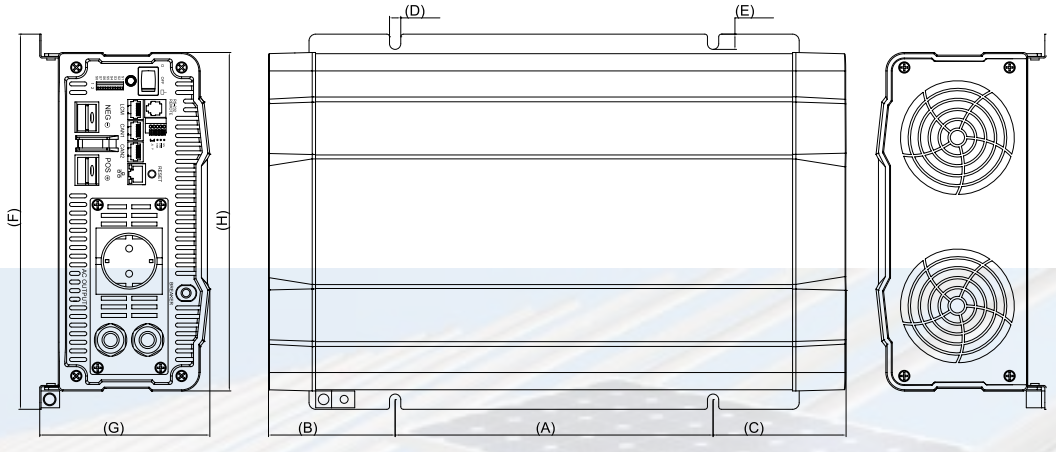
# PURE SINE WAVE INVERTER
## 2500 ~ 3500W

## *Pure sine wave inverter - scalable*

**TRUSTEC-Pure-Wave Inverter "with reliable transfer switch"**
**reliable technology from 2500 to 3500 W** produced for TRUSTEC by Cotek

**Features :**

- Parallel redundancy design for power expansion
- User-friendly LCM Module
- Automatic master mechanism to eliminate single point failure and optimize reliability
- Built-in ATS and AC circuit breaker
- RS-232 and CAN BUS communication
- Input & output fully isolation
- Output voltage / power saving mode selectable
- Input Protection: Reverse Polarity Fuse/ Under Voltage / Over Voltage Protection
- Output Protection: Short Circuit/ Overload/ Over Temperature/ Over Voltage Protection
- Built-in Ethernet function
- High-Tech - robust - inexpensive
- Ideal combination with TRUSTEC CX-charger (15~80A/ 12-24 V)




| | 2500W | 3500W |
|---|---|---|
| A | 240mm | 240mm |
| B | 95.6mm | 125.6mm |
| C | 100.4mm | 130.4mm |
| D | 8.5mm | 8.5mm |
| E | 11.5mm | 11.5mm |
| F | 283.1mm | 283.1mm |
| G | 128.4mm | 128.4mm |
| H | 255.4mm | 255.4mm |

# REIN SINE WAVE INVERTER
## 2500 ~ 3500W

| Model | | SD2500-212 | SD2500-224 | SD2500-248 | SD3500-212 | SD3500-224 | SD3500-248 |
|---|---|---|---|---|---|---|---|
| **Output** | Rated Power | 2500 W | | | 3500 W | | |
| | Surge Power | 4000 W | | | 6000 W | | |
| | Waveform | True Sine Wave | | | | | |
| | Efficiency (full load @ rated VDC) | 88,00% | 88,00% | 90,00% | 90,00% | 91,00% | 91,00% |
| | Output voltage (@rated VDC) | 200/ 220/ 230/ 240 VAC ± 3% | | | | | |
| | Output frequency | 50/ 60Hz ± 0.1% | | | | | |
| | Total Harmonic Distortion (THD) | < 3% (@ rated/ VDC, linear load) | | | | | |
| **Input** | DC Voltage | 12 VDC | 24 VDC | 48 VDC | 12 VDC | 24 VDC | 48 VDC |
| | Voltage Range | 10.0~16.0 VDC | 20.0~32.0 VDC | 40.0~64.0 VDC | 10.0~16.0 VDC | 20.0~32.0 VDC | 40.0~64.0 VDC |
| | Power Consumption @ Save Mode | 1.1 A | 0.7 A | 0.4 A | 1.4 A | 0.5 A | 0.5 A |
| | Power Consumption @ No Load Mode | < 3.6 A | < 1.9 A | < 1.0 A | < 2.5 A | < 1.35 A | < 0.75 A |
| **Protection** | BAT. Low Alarm | 10.5 VDC | 21.0 VDC | 42.0 VDC | 10.5 VDC | 21.0 VDC | 42.0 VDC |
| | BAT. Low Shutdown | 10.0 VDC | 20.0 VDC | 40.0 VDC | 10.0 VDC | 20.0 VDC | 40.0 VDC |
| | BAT. Low Restart | 12.5 VDC | 25.0 VDC | 50.0 VDC | 12.5 VDC | 25.0 VDC | 50.0 VDC |
| | BAT. High Alarm | 15.5 VDC | 31.0 VDC | 62.0 VDC | 15.5 VDC | 31.0 VDC | 62.0 VDC |
| | BAT. High Shutdown | 16.0 VDC | 32.0 VDC | 64.0 VDC | 16.0 VDC | 32.0 VDC | 64.0 VDC |
| | BAT. High Restart | 15.0 VDC | 30.0 VDC | 60.0 VDC | 15.0 VDC | 30.0 VDC | 60.0 VDC |
| | Input Protection | Reverse Polarity (Fuse)/ Under Voltage/ Over Voltage Protection | | | | | |
| | Output Protection | Short Circuit/ Overload/ Over Temperature/ Over Voltage Protection | | | | | |
| | DC Input Reverse Polarity | By Fuse | | | | | |
| **Environment** | Working Temperature | -20°C ~ +60°C | | | | | |
| | Storage Temperature | -30°C ~ +70°C | | | | | |
| | Relative Humidity | Max. 90% non condersing | | | | | |
| **Safety & EMC** | Safety Standards | Certified EN 61558-1, EN 61558-2-16 | | | | | |
| | EMC Standards | Certified EN 55014, EN 61000-3-2, EN 61000-3-3, EN 61000-4-2,3,4,5,6,11 | | | | | |
| **Control & Signal** | LED Indicator | Input voltage level, output load level and faulty status | | | | | |
| | LCM (Optional) | 2 x 16 LCM controll panel | | | | | |
| **other** | Dimensions (W x H x D) | 283.1 x 128.4 x 436 mm | | | 283.1 x 128.4 x 496 mm | | |
| | Weight | 8 kg | | | 10 kg | | |
| | Cooling | Load & Thermal control fan | | | | | |
| | Communication Port | CAN BUS (RJ45), RS 232 (RJ11 type connector) | | | | | |
| | Application | Home and Office appliances, Portable Power Equipment, Vehicle, Yacht and Off-Grid Solar power systems...etc. | | | | | |

# TRUSTEC ADVANCED BATTERY CHARGER

SB series

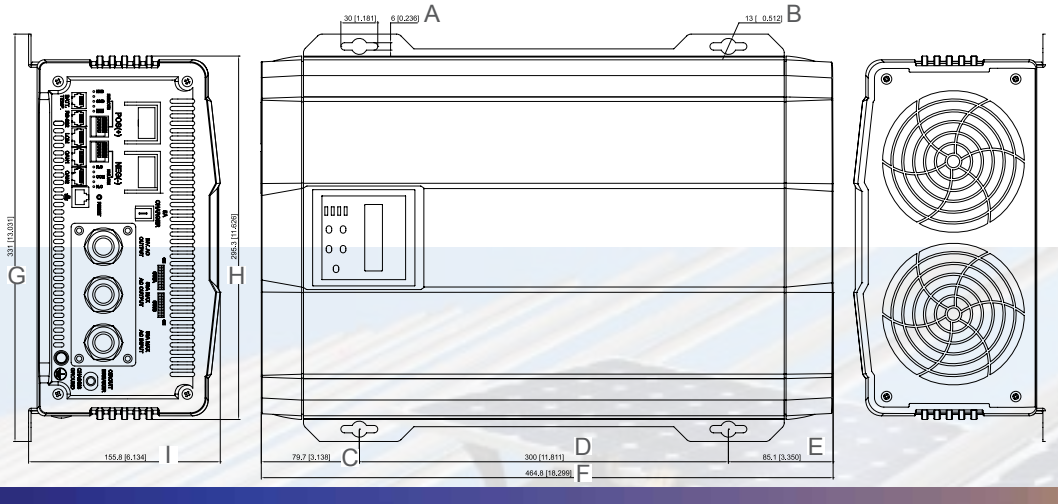
## Advanced inverter battery charger

**TRUSTEC-Pure-Wave Combi-Inverter/ Accu-charger SB "with transfer switch"**
**New technology 2000 W** produced for TRUSTEC by Cotek

### Features :

- DA microprocessor controls self-diagnosis and operation
- User-friendly LCM Module
- Can parallel with the utility AC to generate up to 4 KW
- Battery charger current 100A Max. @12VDC / 50A Max. @24VDC Provide 5A Max. second charger
- Provide 5A Max. second charger
- Built-in 25A rated bypass switch
- Power sharing function between charger and load
- Fan failure alarm with buzzer
- DIP switch and remote control management
- RS-232 and CAN BUS communication
- Dry contact for system alarm
- DC Input Protection: Reverse Polarity Fuse/ Under Voltage / Over Voltage Protection
- AC Input Protection: Short circuit / Under Voltage / Over Voltage Protection
- AC Output Protection: Short Circuit / Overload / Over Temperature Protection

Unit:mm[inch]




| | 2000W |
|---|---|
| A | 30mm |
| B | 13mm |
| C | 79.7mm |
| D | 300mm |
| E | 85.1mm |
| F | 464.8mm |
| G | 331mm |
| H | 295.3mm |
| I | 155.8mm |

# SB series

| Model | | SB2000-212 | SB2000-224 |
|---|---|---|---|
| AC Input Characteristic | Nominal Voltage/ Frequency | 230 VAC / 50 HZ | |
| | Input Voltage Range | 180 ~ 260 VAC | |
| | Input Frequency Range | 47 ~ 63 Hz | |
| | Nominal Current | 7.4 A (@ 230 VAC) | |
| | Efficiency (Full Load) | > 87% | |
| | Power Factor Correction (PFC) | > 0.98 (40% Load) | |
| DC Output Characteristic | Charging Current Range | 20 ~ 100 A | 10 ~ 50 A |
| | Second Charger Output | 5 A, 3-Stage Battery Chargers | 2.5 A, 3-Stage Battery Chargers |
| | Max. Output Voltage | 14.8 VDC | 29.6 VDC |
| | Battery Temperature Compensation | -25mV per°C | -50mV per°C |
| | Bulk Voltage | 14.4 V | 28.8 V |
| | Absorption Voltage | 14.25 V | 28.5 V |
| | Float Voltage | 13.5 V | 27 V |
| | Charger Voltage @Battery Type Setting „Standard“, temperature at 25° C | | |
| | LCD Panel | 2 Lines LCD Panel with keypad for navigation and red/ orange/ green LED | |
| | Remote Control Terminal | Controls the inverter ON/ OFF operation | |
| | Dry Contact Terminal | By a relay | |
| Bypass Relay | Relay Specification | 25 Amp/ 250 VAC | |
| Operating Temperature Range | Full Load | -25 ~ 40°C | |
| | Power De-rating | 50W / °C, 41 ~ 60°C | |
| | Storage | -30 ~ 70°C | |
| Operating Humidity Range | | 0~93% non-condensing | |
| Fan Operation And Indicator | Failure Indication | Buzzer alarm | |
| | Switchen On/ Off | The fan does operate in load and internal temperature control related PWM variable speed controll | |
| Power Sharing Function | Inverter Mode/ Charger mode/ Power sharing (Generator mains support function/ Power support)/ Charger Sharing | | |
| Ground Relay | Ground relay included for Connection of neutral of inverter to ground only at inverter mode. Standard disable | | |
| Safety and EMS | Safety Standards | Meet EN60950-1 | |
| | EMS Standards | FCC Class A | EN55022:1998+A1:2000+A2:2003 Class A<br>EN55024:1997+A1:2001+A2:2003<br>EN61000-3-2:2006 Class A<br>EN61000-3-3:1995+A1:2001 |
| Mechanical Specification | Dimension | 465x331x156 mm / 18.31x13.03x6.14 inch | |
| | Weight | 10.5 Kg (23.1 Lbs) | |

TRUSTEC® energy products

# ADVANCED BATTERY CHARGER

CX series

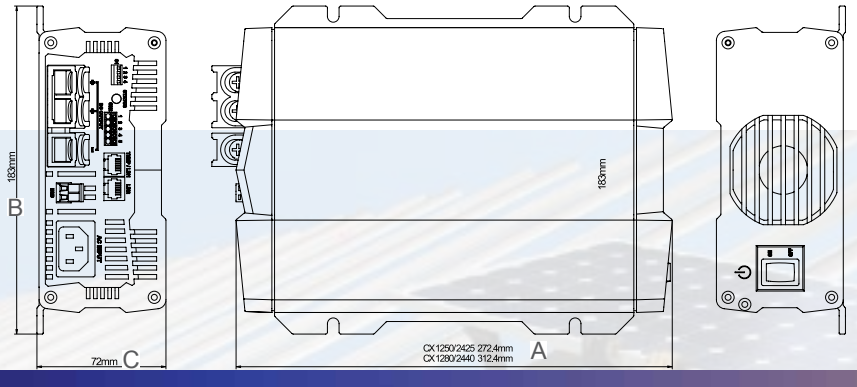
## Advanced Battery Charger

**TRUSTEC-Battery-Charger CX "Superlative functionality"**
**newest technology from 15 to 80 A / 12/24 V - programmable - lead/gel/AGM/Lithium** produced for TRUSTEC by Cotek

### Features :

- Universal AC input with active PFC
- Adjustable charging voltage & time setting capability for each charging stage
- **Compatible with lead adcid, Li-ion, Gel and AGM batteries**
- RS232 communications interface
- Voltage/ temperature compensation
- 2 stage fan speed control
- Output power OK signal
- High efficiency and high reliability
- Built-in battery rescue function
- Built-in Engine Start Battery (ESB) output function
- Protection Short Circuit/ Over Voltage/ Over Temperature/ Brown-out Protection
- Withstand 2G vibration test

| Note | *1. All parameter not specially mentioned are measured at 230 VAC input, rated load and 25 of ambient temperature.*<br>*2. The Charger is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives.*<br>*3. Before charging, make sure the battery charger and battery specifications are compatible.*<br>*4. When use sleep mode, please refer to charging current v.s. Heat sink temperature de-rating curve.* |
|---|---|




| | 1250/2425 | 1280/2440 | 1215/25/15 | 1235 |
|---|---|---|---|---|
| A | 272.4mm | 312.4mm | 243.4mm | 263.4mm |
| B | 213mm | 213mm | 183mm | 183mm |
| C | 76.5mm | 76.5mm | 72mm | 72mm |

# CX series

| Modell | | CX1215 | CX1225 | CX1235 | CX1250 | CX1280 | CX2415 | CX2425 | CX2440 |
|---|---|---|---|---|---|---|---|---|---|
| Output | Battery Type | Lead Acid/ Li-ion/ Gel/ AGM | | | | | | | |
| | Boost Charge Voltage | 14.4V/ 14.7 V | | | | | 28.8V/ 29.4 V | | |
| | Float Charge Voltage | 13.80V | | | | | 27.60V | | |
| | Main Rated Current | 15A | 25A | 35A | 50A | 80A | 12.5A | 25A | 40A |
| | Current Range | 0-15A | 0-25A | 0-35A | 0-50A | 0-80A | 0-12.5A | 0-25A | 0-40A |
| | Main Output | | | | | | | | |
| | ESB Output | | | | - | - | | | |
| | ESB Output/Voltage/ Current | 13.8V/ 2A | | | - | - | | | |
| | Battery Charging Mode | 3-Stage charging capability | | | | | | | |
| | Single Output Current Limit | 15A | 25A | 35A | 40A | 40A | 12.5 A | 25A | 40A |
| Input | Voltage Range | 90-264Vac | | | | | | | |
| | Power Factor (Typ.) | PF>0.92 at full load | | | | | | | |
| | Frequency Range | 47-63Hz | | | | | | | |
| | Efficiency Range | | | | | | | | |
| | Efficiency (Typ.) at 230Vac | 2.5A/ 100Vac | 4.1A/ 100VAC | 6.2A/ 100Vac | 8.24A/ 100Vac | 13.3A/ 100Vac | 4.2A/ 100Vac | 8.3A/ 100VAC | 13.3A/ 100Vac |
| | AC Current (Typ.) | 1.07/ 240Vac | 1.8A/ 240Vac | 2.8A/ 240Vac | 3.6A/ 240Vac | 5.4A/ 240Vac | 1.7/ 240Vac | 3.6A/ 240Vac | 5.4A/ 240Vac |
| | Leakage Current | For earth < 1mA/ 240Vac | | | | | | | |
| Protection | Short Circuit | Current is reduced to < 1A coninued 30sec., fan will operate 30seconds then turn off | | | | | | | |
| | Over Voltage | 17.5V ± 1% | | | | | 35V ± 1% | | |
| | | Protection type: Shut down output (recovery after resetting AC power on) | | | | | | | |
| | Over Temperature | 100 ± 5°C detected by heat sink | | | | | | | |
| | | Protection type: shut down output (recovery after heat sink temperature goes down to 50° C) | | | | | | | |
| | Battery Over Temperature | 52 ± 5°C (optional device – temperature sensor) | | | | | | | |
| Function | Alarm Signal | NC./ NO. Relay contact output | | | | | | | |
| | Communication | RS232 Communication protocol | | | | | | | |
| | Temperature Compensation | -10mV/ 0.5°C provided by optional device - Cotek temperature sensor | | | | | -20mV/ 0.5°C provided by optional device - Cotek temperature sensor | | |
| | Charging Sleep Mode | By remote control and DIP switch (low noise mode) | | | | | | | |
| | Remote Control | 3 colour LED and botton for ON/ OFF and Sleep mode control | | | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Environ-ment | Working Temp. | -20°C - 50°C (refer to output load de-rating curve) | | | | | | | |
| | Working Humidity | 20 – 90% RH non-condensing | | | | | | | |
| | Storage Temp., Humidity | -40°C - +85°C, 20-90% RH | | | | | | | |
| | Temp. Coefficient | ± 0.03% (0°-50°C) | | | | | | | |
| | Vibration | 10-500Hz, 2G 10min./ 1 cycle period for 60min. Each along X, Y, Z axes | | | | | | | |
| Safety & EMC | Safety Standards | Certified EN 60335-1, EN 60335-2-29 | | | | | | | |
| | Withstand Voltage | I/ P-O/P: 4242 VDC, I/P-FG: 1768 VDC, O/P-FG: 700VDC | | | | | | | |
| | Isolation Resistance | I/ P-O/P: 100M Ohms/ 500VDC | | | | | | | |
| | EMI Conduction & Radiation | EN55022 | | | | | | | |
| | Harmonic Current | EN61000-3-2; EN 61000-3-3 | | | | | | | |
| | EMS Immunity | EN 61000-4-2,3,4,5,6,8,11; ENV 50204 | | | | | | | |
| Other | Dimensions (WxHxD mm) | 179x63x238 | 179x63x238 | 179x63x274 | 208.5x75x 283 | 208.5x75x 303 | 179x63x238 | 208.5x75x 283 | 208x75x303 |
| | Packing | 1.6kg | 1,7 kg | 1.9kg | 3.1kg | 4.0 kg | 1.6 kg | 2.9 kg | 3.9 kg |

TRUSTEC® energy products

# 3-STEP BATTERY CHARGER

BP series

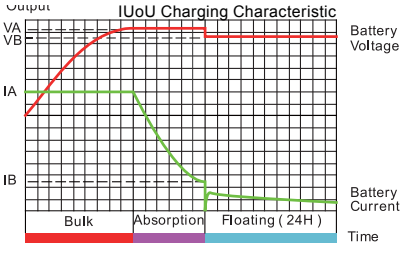
## 144W 3-Step Battery Charger

**TRUSTEC-Battery-Charger BP "Small battery charger"**
**proven 3 step-charging technology for lead/gel battery** produced for TRUSTEC by Cotek

### Features :

- Universal AC input with active PFC
- High - performance 3 - step charging effect
- Advanced 8 bit microprocessor control circuit
- Reverse battery protected by fuse
- Ignition protection
- Over power protection
- Easy to read LED´s for system status
- Compact size, light weight
- Output short circuit protection

### Battery charging curve




### LED Status

| Charging Status | LED Signal | LED Indiction |
|---|---|---|
| Bulk charge | ..... | Fast green blink |
| Absorption charge | — — — | Slow green blink |
| Floating charge | ——— | Solid green |
| Charging failure | — — — | red blink |

| Model | BP-1210 | BP-1205 A | BP-2405 A | BP-2403 A |
|---|---|---|---|---|
| AC Voltage Range | 85 ~ 264 VAC \| 125 ~ 373 VDC | | | |
| AC Frequency Range | 47 ~ 63 Hz | | | |
| AC Current (Max.) | 1.9 A/ 90 VAC, 0.95 A/ 180 VAC | | | |
| AC Inrush Current (Typ.) | Cold Start 30 A / 230 VAC | | | |
| Over Load | 102 ~ 110% rated output power | | | |
| | Protection type: Constant current limiting, Hiccup mode, recovers automatically after fault condition is removed | | | |
| Over Temp. | 85°C + 5°C (TH1) detect on heat sink | | | |
| | -20°C ~ +50°C (Refer to output load de-rating curve) | | | |
| Working Temp. | -20°C ~ +50°C (Siehe Ausgangslast Deratingkurve) | | | |
| Withstand Voltage | I/P – O/P: 3KVAC, I/P – FG: 1.5KVAC, O/P – FG: 0.5KVAC, 1 minute | | | |
| EMC & Safety Standards | EN55022 : 2006 Class B | | | |
| | EN61000-3-2:2006; EN61000-3-3:1995+A1:2001+A2:2005; EN55024:1998+A1:2001+A2:2003 | | | |
| | IEC61000-4-2 Edition 1.2 : 2001 -04; IEC61000 -4 -4 : 2004 | | | |
| | IEC61000-4-5 Edition 1.1 : 2001 -04; IEC61000 –4 -6 : 2004 Edition 2.1 : 2004 -11 | | | |
| | IEC61000 -4 -8 Edition 1.1 : 2001 -03; IEC61000 -4 -11 : 2004 Second Edition : 2004 -03 | | | |
| Dimmension | 210 x 85 x 50 mm / 8.26 x 3.34 x 1.96 inch | | | |
| Packing | 1.0kg / 2.2 Lbs | | | |
| Warranty | 2 years | | | |

TRUSTEC® energy products

CK series

# 220W 4 - Stufen Ladegerät

## Features :

- Green design, No-load power consumption < 1W
- Universal AC input with active PFC
- Advanced 8 bit microprocessor control circuit
- Reverse polarity protected by electronic circuit
- Intelligent output detective protection
- Protections: OVP, OLP, OTP, SCP
- Easy to read LED´s for system status

| Model | CK-1215 | CK-2408 |
|---|---|---|
| | 12V/ 15A | 12V/ 7.5 |
| VA | 14.4 V | 28.8 V |
| VB | 13.6 V | 27.2 V |
| VC | 13.2 V | 26.4 V |
| IA | 15.0 A | 7.5 A |
| IB | 2.25 A | 1.12 A |

| Model | | CK-1215 | CK-2408 |
|---|---|---|---|
| output | DC Voltage range | 14.4 V | 28.8 V |
| | Rated Current | 15 A | 7.5 A |
| | Current Range | 0 ~ 15 A | 0 ~ 7.5 A |
| Input | Efficiency (Typ.) | 83,00% | 86,00% |

| LED Indiction | | LED Signal | Charging Status |
|---|---|---|---|
| orange | Fast Blink | | Bulk charge |
| | Slow Blink | | Absorption charge |
| | Solid | | Floating charge |
| green | Solid | | Storage charge |
| | Blink | | Wire disconnection |
| red | solid | | Charging Failure/ OVP/ UVP |
| | slow Blink | | OTP |

| Model | CK-1215 | CK-2408 |
|---|---|---|
| AC Voltage Range | 100 ~ 264 VAC | |
| AC Frequency Range | 47 ~ 63 Hz | |
| AC Current (max.) | 2.95A/ 100VAC/ 1.52A/ 240 AC | |
| AC Inrush Current (Typ.) | Cold Start 80A/ 230 VAC | |
| Over Load | 100% +/-5% rated output current | |
| | Protection type: Constant current limiting | |
| Over Temp. | 65°C +5°C (N3) detect on heat sink | |
| | Protection type: Output voltage disable, recovers automatically after temperature goes down | |
| Working Temp. | -20°C ~ +50°C (Refer to output load de-rating curve) | |
| Withstand Voltage | I/P – O/P: 4242 VDC, I/P – FG: 2121 VDC, O/P – FG: 707VDC, 1 minute | |
| EMC & Safety Standards | EN60335 -2 -29 | |
| | EN55022 : 2006 Class B | |
| | EN61000 -3 -2 : 2006 | |
| | EN55024, EN61000 -4 -2, 3, 4, 5, 6, 8, 11 | |
| Dimension | 220x85x50mm/ 8.67x3.34x1.96 inch | |
| Weight | 1.2kg/ 2.6 Lbs | |
| Warranty | 2 years | |

TRUSTEC®
energy products

## Product range
### Storage/ Off-Grid/ Inverter

**Solar energy storage technology to full self-sufficiency**

- for home, commercial and industrial of 2.5 kWh to MWh
- solar power self-marketing
- power stabilization for network providers

**Solar Off-Grid storage technology**

- Off-Grid Storage Systems
- solar inverters, batteries and Off-grid systems components
- solar tracker & moduls

**High-tech solar inverter - Diehl-technology -**

- single phase
- three-phase
- for all solar installations from 2 kW to MW

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